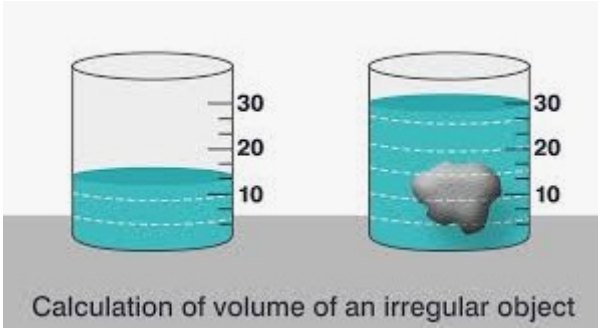
The Implications of Water Displacement by Marine Vessels on Ocean Level Rise, by Kyle Craig

Abstract: This thesis explores the correlation between the increasing size and number of modern marine vessels and the rising ocean levels. I aim to analyze the principles of buoyancy and water displacement, and their contribution to the observed phenomenon of ocean level rise, traditionally attributed to climate change and ice shelf melt.

Using the analogy of my daughters toys in a bathtub, this paper investigates how the cumulative effect of launching large ships into the oceans contributes to unappreciated water displacement and subsequent rise in sea levels. I develop this thesis to promote/provoke geopolitical discussion.

Introduction: The global rise in sea levels has been a topic of significant concern, traditionally attributed to the melting of polar ice caps and thermal expansion due to climate change. However, an often overlooked factor is the displacement caused by the increasing number and size of marine vessels. This paper aims to explore this underrepresented aspect by examining the basic principles of buoyancy and water displacement.



Calculation of volume of an irregular object

The Science of Buoyancy and Water Displacement:

- **Archimedes' Principle:** Archimedes' principle states that the upward buoyant force exerted on a body immersed in a fluid is equal to the weight of the fluid that the body displaces. This principle applies to ships and marine vessels, where the volume of water displaced by a ship is directly proportional to its weight.
- **Water Displacement by Vessels:** When ships and marine vessels built on land are introduced into the ocean, they displace a significant volume of water. As the size of these vessels increases, so does the volume of water displaced.

Case Study: Analogy of Isla and Kindred's Toys in a Bathtub:

- **My Observation:** Similar to how adding toys to a bathtub causes the water level to rise and eventually spill over, the introduction of large ships into the ocean displaces water, contributing to a rise in sea levels.
- **Implications:** This analogy helps to simplify and understand the concept of water displacement on a larger scale.

Modern Marine Vessels and Water Displacement:

- **Super Tankers and Mega Ships:** The demand and thus emergence of super tankers and mega ships has led to unprecedented levels of water displacement. These modern marine giants displace large volumes of water, contributing to the overall rise in sea levels.

- **Increasing Number of Vessels:** With globalization and the growth of international trade, the number of ships operating in the oceans has increased significantly, exacerbating the effect of water displacement.

Implications of Water Displacement on Sea Level Rise:

- **Contribution to Ocean Level Rise:** While the primary contributors to rising sea levels are climate change and ice shelf melt, the cumulative effect of water displacement by marine vessels cannot and I say should not be ignored.
- **Environmental Impact:** Rising sea levels have dire consequences for coastal ecosystems, human settlements, and marine life. It is crucial to consider all contributing factors to develop comprehensive strategies for mitigation.

Future Projections and Recommendations:

- **Mitigation Strategies:**
    - Investing in research to better understand the impact of water displacement on sea levels.
- **Technological Innovations:**
    - Developing technologies to monitor and manage water displacement.
    - Exploring alternative shipping methods that minimize water displacement.

Conclusion: While climate change and ice shelf melt remain the primary focus of the driver of rising sea levels, the role of water displacement by marine vessels is a valid and important consideration. By understanding and addressing this aspect, we can develop more effective strategies to mitigate or atleast measure the impact of rising sea levels on our planet.

Developed By:

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